Oct. 13, 1964 J. J. SCOTT 3,152,853

TERMINAL AND TERMINAL BOARD

Filed May 2, 1961

FIG. 1

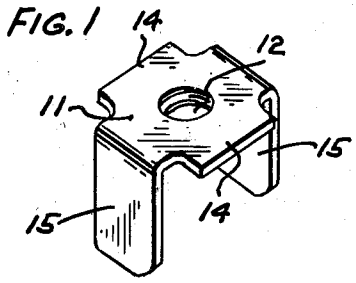


FIG. 2

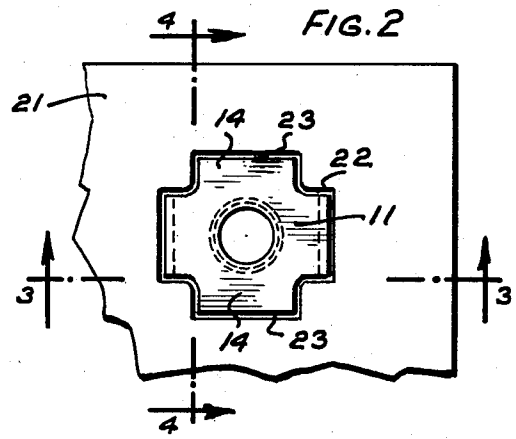


FIG. 3

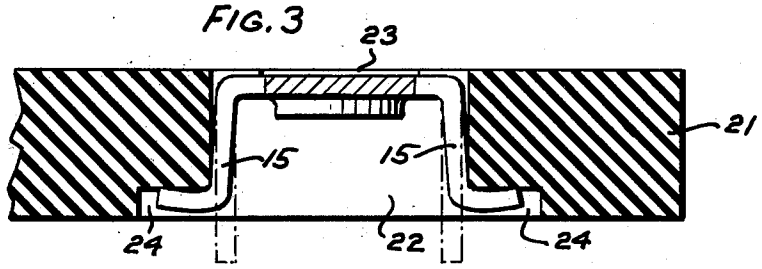


FIG. 4

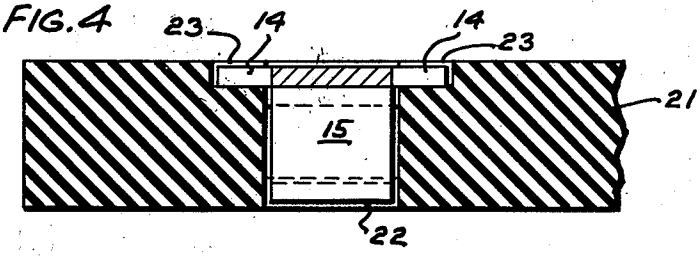
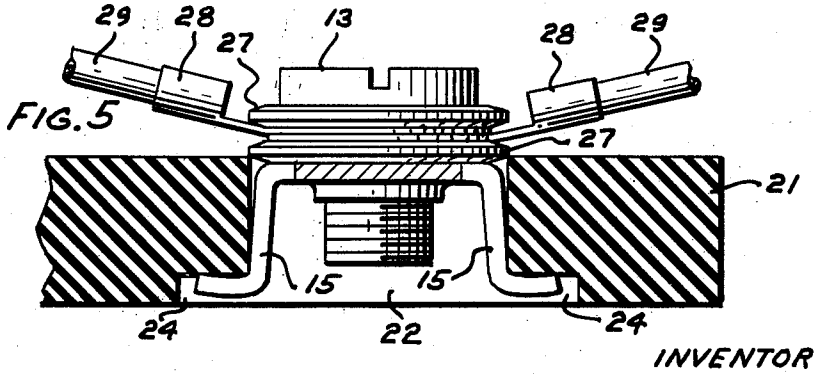


FIG. 5



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TERMINAL AND TERMINAL BOARD

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This invention relates to terminals and terminal boards such as are commonly employed to anchor the ends of electrical leads. It is an object of the invention to provide improved apparatus of this character.

Prior art apparatus of this character has been subject to various deficiencies. Threaded eyelets, for example, are subject to being loosened with respect to the cooperating terminal board such that they may rotate with respect thereto. This defect prevents proper tightening of a terminal screw which is intended to cooperate therewith, or the eyelet may break loose during the tapping of the eyelet such that the tapping operation may not be completed. Other forms of terminals require two or more openings in the terminal board, one for free reception of the terminal screw and at least one for reception of terminal anchoring devices. Such a plurality of openings for each terminal is undesirable both from a cost standpoint and because of the fact that the openings weaken the terminal board. Still other forms of terminals are structurally weak, inconvenient in use and/or expensive to manufacture or install.

A terminal constructed in accordance with the present invention may be tapped, if desired, either before or after assembly with the cooperating terminal board. It is inherently firmly securable to a terminal board, such that accidental loosening is substantially avoided. At the same time, only a single opening is required in the cooperating terminal board for receiving and seating a single terminal.

In accordance with one embodiment of the invention, the terminal is formed from heavy sheet material, has a central portion apertured to receive a terminal screw, shoulders extending from opposite edges of the central portion for engaging one surface of the cooperating terminal strip, and a pair of arms extending from the other intermediate edges of the central portion and perpendicular to the central portion, these arms extending through a common opening in the cooperating terminal board. The ends of the arms are arranged to be bent over against the other surface of the cooperating terminal board such that the terminal board is locked between the shoulders and the extremities of the arms. The common opening in the terminal board through which the arms of the terminal extend also serves to receive freely a terminal screw which is threadedly received in the aperture of the terminal. The terminal board may, desirably, be recessed adjacent the opening on one surface to receive the shoulders of the terminal and on the other surface to receive the bent-over ends of the arms of the terminal. The entire terminal may thereby be arranged to lie between the planes of the principal surfaces of the terminal board.

It is another object of the invention to provide an improved terminal which may be firmly seated within a single aperture in a cooperating terminal board.

It is still another object of the invention to provide an improved terminal which may be firmly seated within a single aperture in a cooperating terminal board and which firmly resists rotation of the terminal with respect to the terminal board as well as removal of the terminal therefrom.

It is a further object of the invention to provide an improved combination of terminal board and terminal

wherein the terminal is firmly seated within a single opening in the terminal board, which opening also serves to receive a cooperating terminal screw.

It is a still further object of the invention to provide an improved combination of terminal board and terminal wherein the terminal is firmly seated within a single opening in the terminal board and substantially between the planes of the two principal surfaces of the terminal board.

Another object of the invention is to provide an improved terminal and an improved combination of terminal board and terminal which are inherently rugged in construction, reliable in operation and economical to manufacture.

This invention, together with further objects and advantages thereof, will best be understood by reference to the following description taken in connection with the accompanying drawing, and its scope will be pointed out in the appended claims.

In the drawing in which like parts are designated by like reference numerals,

FIG. 1 is a perspective view of a terminal illustrating a preferred embodiment of the invention;

FIG. 2 is a plan view of a terminal board with the terminal of FIG. 1 arranged in cooperating relationship therewith;

FIG. 3 is an enlarged cross-sectional view taken along the line 3—3 of FIG. 2;

FIG. 4 is an enlarged cross-sectional view taken along line 4—4 of FIG. 2, and

FIG. 5 is a cross-sectional view similar to FIG. 3 but showing a cooperating terminal screw, washers and electrical leads associated therewith.

The illustrated embodiment of the terminal, best seen in FIG. 1, includes a generally rectangular sheet-like central portion 11 which is apertured at 12 to receive a terminal screw 13, seen only in FIG. 5. The aperture 12 is preferably pre-tapped such that the screw 13 may readily be inserted therein. If preferred, however, the aperture 12 may be left untapped and a self-tapping or thread-forming screw may be employed in place of the conventional screw 13.

A pair of shoulders 14 extend outwardly in opposite directions from opposite sides of the central portion 11. A pair of legs 15 extend from the other edges of the central portion 11 and in a direction generally perpendicular to the plane of the central portion 11.

A terminal board 21 is shown in FIGS. 2–5 to have a single rectangular aperture 22 therein through which both of the legs 15 may extend. It will be appreciated that the terminal may be arranged in the opening 22 in the terminal board with the legs 15 being substantially in the position indicated by the phantom lines in FIG. 3. The free ends of the arms may then be bent over to the positions indicated by the solid lines in FIG. 3 such that the terminal is held in position with respect to the terminal board.

The terminal board 21 has recesses 23 in its upper surface for receiving the shoulders 14, as best seen in FIG. 4, such that the entire terminal, and particularly the center portion 11 and the shoulders 14, may lie below the plane of the principal upper surface of the terminal board. The terminal board has recesses 24 to receive the bent-over ends of the legs 15 as best seen in FIG. 3, whereby no portion of the terminal, and particularly the ends of the legs 15, protrude beyond the plane of the principal lower surface of the terminal board.

It may now be seen that the two shoulders 14 engage one surface of the terminal board, whereas the bent-over ends of the legs 15 engage the other surface of the terminal board, whereby the terminal board is gripped therebetween. While both the shoulders and the bent-over

ends of the legs are received in recesses provided for that purpose, in order that the terminal may lie entirely between the planes of the two principal surfaces of the terminal board, it will be appreciated that the shoulders and the bent-over ends of the legs nevertheless engage opposed surfaces of the terminal board.

In use, the terminal screw 13 is screwed into the aperture 12, preferably prethreaded, with suitable washers 27 arranged thereon. With the lugs 28 of electrical leads 29, or mere bared lead ends, arranged between the washers 27, the screw 13 may be tightened to anchor the associated leads and to connect them together electrically.

It will now be apparent that the terminal illustrated in the drawing is held firmly in its assembled position with respect to the terminal board. In order for the terminal to be separated from the terminal board, either the legs 15 must be pulled upward through the opening 22, or the shoulders 14 must be pulled downward through the opening 22. It will be apparent also that rotation of the terminal with respect to the terminal board is impossible without the application of destructive forces.

It will also be evident that the terminal is very economical to manufacture. The terminal may be stamped from heavy gauge sheet metal in the form of a cross having two opposed long arms and two opposed short arms (the shoulders 14). At the same time, the aperture 12 may be formed, and, if desired, the aperture may then be threaded. The legs 15 may then be bent such that they extend substantially perpendicular to the main portion 11 of the terminal. It will be apparent that installation of the terminal in a terminal board is a simple and inexpensive operation requiring no special tools or skills. Still further, the terminal lends itself to automatic, high-speed production, and to automatic assembly with the associated terminal board.

It will be apparent to those skilled in the art that the illustrated embodiment of the invention may be modified in various ways without departing from the spirit of the invention. By way of example only, the central portion 11 of the terminal may be made of such size as to permit a row of apertures or rows of apertures for receiving a plurality of terminal screws. The terminal may also be arranged to cooperate with various types of terminal fasteners, some requiring a simple opening or openings in the terminal body.

It is to be understood that the above-described arrangements are simply illustrative of the application of the principles of the invention. Numerous other arrangements may be devised readily by those skilled in the art

which will embody the principles of the invention and fall within the spirit and scope thereof.

What is claimed is:

1. In combination, a terminal board and a terminal, said terminal board having an opening therethrough, said terminal comprising a sheet-like central portion apertured to receive a terminal fastener, a pair of shoulders lying in the general plane of said sheet-like central portion and extending outwardly in opposite directions from opposite edges of said central portion, said shoulders engaging one surface of said terminal board adjacent opposite sides of said opening, and a pair of arms extending from edges of said central portion intermediate said opposite edges through said opening in said terminal board and away from each other and along the opposed surface of said terminal board adjacent said opening, whereby said shoulders and portions of said arms grip said terminal board therebetween.

2. In combination, a terminal board and a terminal, said terminal board having an opening therethrough and having a pair of recesses in one surface thereof extending from opposite sides of said opening and a pair of recesses in the other surface thereof extending from opposite sides of said opening, the recesses in one surface of said terminal board being displaced 90° about the axis of said opening with respect to the other pair of recesses, said terminal comprising a sheet-like central portion apertured to receive a terminal fastener, a pair of shoulders lying in the general plane of said sheet-like central portion and extending outwardly in opposite directions from opposite edges of said central portion, said shoulders extending into the pair of recesses in one side of said terminal board, and a pair of arms extending from edges of said central portion intermediate said opposite edges through said opening in said terminal board and away from each other and into the pair of recesses in the other side of said terminal board, whereby said shoulders and portions of said arms grip said terminal board therebetween.

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